REMARKS/ARGUMENTS

In the outstanding Office Action, Claims 1-7 were examined. Claims 1-7 are rejected. Specifically, Claims 1-3 are rejected under 35 U.S.C. § 102(b). Claims 4-5 and 6-7 are rejected under 35 U.S.C. § 103(a). In response, Applicants request reconsideration of the application in view of the following remarks. Also, the Abstract is amended to comply with the Examiner's request.

I. Claims Rejected Under 35 U.S.C. § 102(b)

It is asserted in the Office Action that Claims 1-3 are rejected in the Office Action under 35 U.S.C. § 102(b), as being anticipated by U. S. Patent No. 6,023,467 issued to Abdelhamid et al ("Abdelhamid"). In response, Applicants respectfully traverse the aforementioned rejection for the following reasons. To anticipate a claim, the Examiner must show that the cited reference teaches each element of a claim.

Regarding Claim 1, the Examiners relied on Abdelhamid to teach each and every element of Claim 1. However, Abdelhamid discloses the asynchronous transfer mode ("ATM") based Passive Optical Network ("ATM-PON") (column 1, lines 40-41). In particular, Abdelhamid's "Summary of the Invention" discloses that "The present invention provides both functional definitions and data transmission protocols for both downstream and upstream OAM[1] data flows in an ATM-based point-to-multipoint broadband communication network." (column 3, line 65-66 – column 4, lines 1-2).

In contrast, the elements of Claim 1 are based on the Ethernet Passive Optical Network ("EPON"). ATM-PON and EPON differ fundamentally because ATM-based technology can only "encode data traffic into small fixed-sized (53 byte; 48 bytes of data and 5 bytes of header information) cells instead of variable sized *packets* (sometimes known as *frames*) as in packet-

[1] OAM stands for Operations, Administration and Maintenance data. Abdelhamid (column 2, lines. 1-3). OAM functions are generally categorized into performance, fault, configuration, accounting, security and traffic management data. Abdelhamid (column 2, lines. 4-6).

switched networks (such as the Internet Protocol or Ethernet)."[2] Specifically, "Ethernet frame lengths can vary greatly (64 to 1514 bytes) depending on the size of the protocol header, data and pad."[3] Moreover, the cost of implementing the ATM-PON is much higher than Ethernet-based PON because Ethernet has achieved much wider audience and it is easier to operate.[4] As a result, Abdelhamid does not teach or suggest every element of Claim 1.

Finally, Abdelhamid's disclosure is limited to the system data, or the so-called "OAM" data.[5] On the other hand, Claim 1 is directed to a bandwidth allocation device for an Ethernet Passive Optical Network. It is apparent that EPON of Claim 1 is not limited to the transfer of OAM data because EPON can potentially handle broader bandwidth at any given time.

Regarding Claims 2 and 3, these claims depend from Claim 1 and therefore incorporate the limitations of that claim. Thus, for at least the reasons stated above, the dependent claims are not anticipated by Abdelhamid. Accordingly, reconsideration and withdrawal of the 35 U.S.C § 102(b) rejection of Claims 1-3 are respectfully requested.

II. Claims Rejected Under 35 U.S.C. § 103(a)

A. It is asserted in the Office Action that Claims 4 and 5 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Abdelhamid in view of U. S. Patent No. 5,796,732 issued to Mazzola et al ("Mazzola"). In response, Applicants respectfully traverse the aforementioned rejection for the following reasons.

With respect to Claim 4, the EPON in Claim 4 differs from ATM-PON in Abdelhamid (see Remarks above for Claim 1). Thus, at least for the reasons mentioned above, Abdelhamid does not teach or suggest every element of Claim 4.

---

[2] http://en.wikipedia.org/wiki/Asynchronous_Transfer_Mode (Wikipedia).

[3] http://www.intel.com/network/connectivity/resources/doc_library/white_papers/solutions/copper_guide/gig_over_copper.htm (Under the heading "The Cost-effective choice").

[4] "**Ethernet has repeatedly demonstrated cost advantages over every other networking technology, including ATM**, SONET, and frame relay. This has been proven repeatedly over the years as Ethernet has consistently been enhanced to deliver new levels of bandwidth at record-breaking new cost points." (emphasis added). http://www.wwp.com/technology/switched-ethernet-v-pon.asp

[5] *See above*, footnote 1.

Although the Examiner conceded that "Mazzola et al. does not specifically disclose the steps 2 – 7", the Examiner went on to state that "However, one skilled in the art would believe that those steps are part of the 'Round-Robin scheme' as taught by Mazzola et al. where different requests are granted based on their priority levels." (Office Action, P. 7).

While the goals of both Mazzola and Claim 4 are to render the transmission more reliable and faster, the Round-Robin scheme disclosed in Mazzola is not equivalent to the 3-layer (High-Medium-Low Priorities) algorithm in Claim 4. Specifically, the Round-Robin algorithm proposed in Mazzola never discusses the scenarios when the bandwidth (link capacity) is insufficient. For instance, the second step in Claim 4 recites that "when a sum of bandwidths for HP (High Priority) of all ONUs is more than a link capacity, allocating a bandwidth **PROPORTIONAL** to the bandwidth for HP of each of the ONUs to each of the ONUs in the same order as a previously allocated order of ONUs, if there is a previously allocated order of ONUs." (emphasis added). To sum up, Claim 4 teaches in situations where HP data exceeds the link capacity.

In comparison, Mazzola does not teach in such a scenario. Mazzola merely teaches that "High requests are serviced at all times prior to reaching the threshold number, whereas medium requests can only be serviced in the absence of a high request or when the high request threshold is reached." (column 9, lines 66-67, column 10, lines 1-3). Thus, Mazzola neither teaches nor suggests the second step disclosed in Claim 4.

By analogy, the rejections based on the rest of the steps (steps 3 through 7) of Claim 4 should also be withdrawn because Mazzola does not teach scenarios where medium priority or low priority exceeds the bandwidth. Accordingly, reconsideration and withdrawal of the 35 U.S.C § 103(b) rejection of Claims 4 are respectfully requested.

Regarding Claim 5, it depends from Claim 4 and therefore incorporates the limitations of that claim. Thus, for at least the reasons stated above, Abdelhamid in view of Mazzola does not teach Claim 5. Accordingly, reconsideration and withdrawal of the 35 U.S.C § 103(b) rejection of Claims 5 are respectfully requested.

B. It is asserted in the Office Action that claims 6 and 7 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Abdelhamid and Mazzola, and further in view of U. S. Patent 6,275,502 issued to Arimilli et al ("Arimilli"). Applicants respectfully traverse the aforementioned rejection for the following reasons.

Regarding Claim 6, it depends from independent Claim 4 and incorporates the limitations thereof. Thus, at least for the reasons mentioned above in regard to independent Claim 4, Abdelhamid in view of Mazzola and in view of Arimilli does not teach or suggest each of the elements of Claim 6.

With respect to Claim 7, the EPON in Claim 7 differs from ATM-PON in Abdelhamid (see Remarks above for Claim 1). Thus, at least for the reasons mentioned above, Abdelhamid does not teach or suggest every element of Claim 7. Accordingly, reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejections for Claims 7 are respectfully requested.

CONCLUSION

In view of the forgoing, it is believed that all claims now pending are in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

Dated: November 1, 2006

By: _____
Eric S. Hyman, Reg. No. 30139

12400 Wilshire Boulevard
Seventh Floor
Los Angeles, California 90025
(310) 207-3800

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia 22313-1450 on November 1, 2006.

_____
Jean Svoboda

AMENDMENTS TO THE ABSTRACT

Please replace the abstract as follows. The abstract is also submitted on a separate sheet with the response.

~~Disclosed is a bandwidth allocation device and a dynamic bandwidth allocation method wherein an Ethernet frame is used for upstream/downstream transmission between an OLT and ONUs, the amount of bandwidth requested by the ONUs is reserved in advance based on class of service using an upstream frame, and, as a grant operation in response to these requests, a bandwidth allocation is dynamically performed to guarantee the QoS of each service. The OLT includes an MPCP allocator, and the ONU includes an MPCP requester. The MPCP allocator includes a class-based queue state counter and a grant generator. Upon receipt of a REPORT from a MAC control layer, this counter differentiates the ONU and obtains class-based queue length information of the ONU. When queue state information of all ONUs is obtained through the counter, the grant generator generates a service-based bandwidth for each ONU, and transmits a GATE. The MPCP requester includes a class-based buffer counter and a request generator. Upon receipt of the GATE from the grant generator, the buffer counter counts a class-based buffer length. The request generator generates class-based buffer length information, and transmits the REPORT containing the generated information.~~

A bandwidth allocation device and a dynamic bandwidth allocation method are provided for differentiated classes of service in an Ethernet Passive Optical Network (EPON), which includes an optical line termination (OLT), an optical distribution network (ODN), and a plurality of optical network units (ONUs). The OLT includes a Multi-Point Control Protocol (MPCP) allocator, which includes a class-based queue state counter and a grant generator. The ONU includes an MPCP requester, which includes a class-based buffer counter and a request generator. The device and the method enable efficient utilization of network resources using class-based grant allocation.